WHAT IS CLAIMED IS:

1. A cooling device for cooling disks of high-pressure and low-pressure turbines of a turbomachine, said device being fed with cooling air from at least one air orifice formed through a bottom annular platform for supporting at least one fixed vane of said low-pressure turbine and being disposed between an upstream flange and a downstream flange of said bottom platform, the device comprising:

· an upstream annular plate extending radially from the upstream flange of said bottom platform;

· a downstream annular plate extending radially from the downstream flange of the bottom platform, said upstream and downstream plates longitudinally defining at least one annular cavity for cooling air;

· a sealing device extending longitudinally between said upstream and downstream plates so as to close the cooling air cavity in leaktight manner;

· holding means for holding said upstream and downstream plates against the upstream and downstream flanges of said bottom platform; and

· a plurality of holes for injecting cooling air towards the turbine disks.

2. A device according to claim 1, wherein the upstream plate includes a link portion linked to the bottom platform and formed by a substantially radial annular wall, and an injection portion formed by a substantially radial first annular wall offset radially and longitudinally downstream relative to said link portion, a second substantially radial annular wall offset longitudinally downstream relative to said first radial wall, and a first substantially longitudinal annular wall extending between the radial wall of said link portion and the second radial wall of said injection portion so as to subdivide the cooling air cavity longitudinally into a bottom zone and a top zone.

3. A device according to claim 2, wherein the injection portion of the upstream plate further comprises a second substantially-longitudinal annular wall extending between the first and second radial walls and disposed between the first longitudinal wall and the sealing device so as to subdivide the bottom zone into a mounting zone and an injection zone.

4. A device according to claim 3, wherein the injection portion of the upstream plate further comprises a plurality of substantially radial partitions extending between the first and second longitudinal walls and disposed perpendicularly to the first and second radial walls so as to subdivide the mounting zone into a plurality of annular cavities.

5. A device according to claim 4, wherein the first longitudinal wall of said injection portion of the upstream plate includes communication openings providing communication between the bottom and top zones so as to feed cooling air to at least one annular cavity, said communication openings having axes extending radially in register with said air orifices formed through the bottom platform.

6. A device according to claim 5, wherein said at least one annular cavity fed with cooling air includes at least one passage in the second longitudinal wall for feeding the injection zone with cooling air.

7. A device according to claim 6, wherein the injection zone presents a plurality of holes formed through the first and second radial walls of the injection portion of the upstream plate in order to inject cooling air towards the turbine disks.

8. A device according to claim 5, further comprising link tubes disposed in each communication opening in order to guide the cooling air towards said at least one annular cavity.

9. A device according to claim 8, further including radial retention devices for retaining each of said link tubes.

10. A device according to claim 8, wherein the second radial wall of the injection portion of the upstream plate includes a plurality of annular windows for mounting said link tubes.

11. A device according to claim 2, wherein the downstream plate includes a link portion connecting with the bottom platform formed by a substantially radial annular wall, and a holding portion for holding the upstream plate formed by a substantially radial annular wall offset radially and longitudinally upstream relative to said link portion and disposed against the second radial wall of the injection portion of the upstream plate, and a substantially longitudinal annular wall extending between the radial wall of said link portion and the radial wall of said holding portion.

12. A device according to claim 1, further comprising an additional annular plate extending radially between the sealing device and a flange of the disk of moving blades of the high-pressure turbine so as to define a high-pressure enclosure and a low-pressure enclosure on either side of said cooling device.

13. A device according to claim 12, further comprising stiffener elements disposed between the ends of said additional annular plate in order to improve the dynamic behavior of the cooling device.

14. A device according to claim 1, further comprising an antirotation device for preventing said upstream and downstream plate from rotating.

15. A device according to claim 1, wherein said upstream and downstream plates are made as a single piece.